

PATENT APPLICATION

**GAMING MACHINE
COMMUNICATING SYSTEM**

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GAMING MACHINE COMMUNICATING SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part and claims priority under 35 U.S.C. §120 from co-pending U.S. Patent Application 10/044,218, filed November 19, 2001, naming Richard E. Rowe as inventor, and titled “WIRELESS GAMING ENVIRONMENT” which claimed priority under 35 U.S.C. § 120 from co-pending U.S. application no. 09/544,884 filed April 7, 2000 naming Richard E. Rowe as inventor, and titled " WIRELESS GAMING ENVIRONMENT,” now issued as U.S. patent 6,682,421 each of which is incorporated herein in their entirety and for all purposes;

[0002] and the application is a continuation-in-part and claims priority under 35 U.S.C. §120 from co-pending U.S. Patent Application 09/718,974, filed November 22, 2000, naming Richard E. Rowe as inventor, and titled, “EZ PAY SMART CARD AND TICKET SYSTEM,” which is incorporated here in its entirety and for all purposes;

[0003] and the application claims priority under 35 U.S.C. §119(a) from Australian Application No. 2003 901 552, filed 3 April 2003 in the Australian Patent office and titled “GAMING MACHINE COMMUNICATING SYSTEM,” which is incorporated herein in its entirety and for all purposes.

TECHNICAL FIELD

[0004] The present invention relates to gaming establishments having a plurality of gaming machines and, in particular, to a communications and data transfer system for such gaming establishments.

BACKGROUND

[0005] There are many functions that might be termed “low security” which are carried out by employees of the gaming establishment which require interaction between the employee and the machine. An example of such an interaction is switching all machines at a venue, or all machines in a given locality at a venue, to operate a specific game. For example, if a venue is expecting a lunch time visit by a group of elderly bowlers, croquet players, or the like, the venue may wish to have the gaming machines offer games which appeal to elderly players. However, at the same venue on the evening of the same day, the venue may be hosting an engagement reception at which the guests will predominantly be young friends of the engaged couple. Thus, under these circumstances, it is desirable to have the gaming machines offer games that appeal to young adult players. Clearly, a need therefore exists for such machines to be quickly changed from the one game to another. There are other functions of a similar nature (to be described hereafter), which might also be termed “low security” functions.

[0006] This is to be contrasted with other functions requiring interaction between an operator and the gaming machines. Typically, these interactions require access to the interior of a gaming machine and are carried out under strict security protocols. For instance, when access to the gaming machine is authorized, it is often requires two or more people to be present at the gaming machine, a technician and a regulator

from the gaming jurisdiction or a security person from the casino. These might for convenience be termed “high security” functions.

[0007] One example of a “high security,” activity is the changing of the data and instructions constituting the operating software of a game or games. Not only is such data voluminous (typically approximately 30 – 100 Mb) but also the link must be secure against criminal elements that may seek to tamper with such software. Another example of what might be termed “high security” activity is the monitoring of game results and the provision of data to game licensing authorities upon which data the taxation liability of the venue can be, or is, calculated.

[0008] In the gaming industry there is a desire to provide “low security” and “high security,” services for gaming machines at their point of operation (e.g., in a casino) while limiting time costs and labor costs associated with these services (A time cost may be revenues that are lost when a gaming machine is not operable during servicing.) Therefore, in view of the above, it is desirable to provide a communication and data transfer system for gaming establishments which enables the status of gaming machines to be monitored and/or various operational control parameters of gaming machines to be changed in a more timely and less labor intensive manner.

[0009] SUMMARY

[0010] In accordance with a first aspect of the present invention there is disclosed a communications and data transfer system for gaming establishments having a plurality of gaming machines arranged in proximity to each other, said system comprising a hand held portable transponder adapted to transmit and receive modulated electromagnetic radiation over a limited range which approximates to only the linear distance occupied by said gaming machines, said transponder further having a display means and input means, and each of said gaming machines includes a communication module connected with the electronic controller of each said gaming machine whereby identification and control signals for a specific one or ones of said plurality of adjacent gaming machines can be input to, and sent from, said transponder to the master gaming controller of the selected gaming machine(s) and in reply thereto, status data of said selected gaming machine(s) can be sent to, or overwritten by, said transponder.

[0011] The communication with the gaming machine may be provided through a wireless interface on the gaming machine. In one embodiment, the wireless interface may be located on a player tracking unit connected to the gaming machine. In another embodiment, the wireless interface may be provided through an antenna coupled to the gaming machine.

[0012] In accordance with a second aspect of the present invention there is disclosed a method of outputting or changing status data of a selected one or ones of a plurality of electronic gaming machines each having a master gaming controller with an electromagnetic communication module connected thereto, said plurality of gaming machines being arranged in proximity to each other in a gaming establishment. The method may be generally characterized as comprising (i) bringing

within range of said selected gaming machine a hand held portable transponder adapted to transmit and receive modulated electromagnetic radiation over a limited range which approximates to only the linear distance occupied by said gaming machines, (ii) transmitting identification and control signals from said transponder to said selected gaming machine(s) to both select same and enable the electronic controller thereof, and receiving from said selected gaming machine(s) at said transponder, status data of said selected gaming machine, and/or transmitting from said transponder to said selected gaming machine(s) status data which is over-written into the master gaming controller of said selected gaming machine(s).

[0013] These and other features and advantages of the present invention will be described in the following description of the invention and associated figures.

[0014] BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The included drawings are for illustrative purposes and serve only to provide examples of possible structures and process steps for the disclosed inventive systems and methods for providing player verification in remote gaming terminals and other associated locations. These drawings in no way limit any changes in form and detail that may be made to the invention by one skilled in the art without departing from the spirit and scope of the invention.

[0016] FIG. 1 is a perspective view of a prior art multigame poker machine.

[0017] FIG. 2 is a perspective view of one embodiment of a multigame poker machine of the present invention.

[0018] FIG. 3 illustrates the layout of a gaming establishment having a plurality of the machines of Fig. 2.

[0019] FIG. 4 illustrates the master gaming controller and communications module of the machine of Figs. 2 and 3 communicating with the transponder of Fig. 3.

DETAILED DESCRIPTION

[0020] Exemplary applications of systems and methods according to the present invention are described in this section. These examples are being provided solely to add context and aid in the understanding of the invention. It will thus be apparent to one skilled in the art that the present invention may be practiced without some or all of these specific details. In other instances, well known process steps have not been described in detail in order to avoid unnecessarily obscuring the present invention. Other applications are possible, such that the following example should not be taken as definitive or limiting either in scope or setting.

[0021] In the following detailed description, references are made to the accompanying drawings, which form a part of the description and in which are shown, by way of illustration, specific embodiments of the present invention. Although these embodiments are described in sufficient detail to enable one skilled in the art to practice the invention, it is understood that these examples are not limiting; such that other embodiments may be used, and changes may be made without departing from the spirit and scope of the invention.

[0022] As seen in Fig. 1 a prior art gaming machine 1 has a video screen 2 located between an upper panel 3 and a lower panel 4. The screen 2 displays moving images (typically of rotating reels each of which carries symbols of various kinds), whilst the panels 3,4 carry artwork of various kinds, which is fixed as to the information displayed. Conventionally, the upper panel 3 displays the name of the game or games offered by the machine and is intended to attract a player to the machine. The lower panel 4 typically sets out the table of winning combinations and information about the rules of the game, which a player needs to know. Also provided but not illustrated are conventional items such as a coin receiving slot, bill receptacle, play and reserve buttons, and the like.

[0023] This is to be contrasted with the gaming machine 11 of the preferred embodiment illustrated in Fig. 2 which has a substantially conventional (lower) screen 12 and panel 14 but has an upper screen 13 instead of the upper panel 3. As before, the panel 14 sets out the table of winning combinations, etc and the conventional coin receiving slot etc. are not illustrated in Fig. 2. Details of a gaming machine with a secondary display, such as upper screen 13, that may be used with the present invention are described in U.S. patent 6,135,884, issued 10/24/2000 and titled "GAMING MACHINE HAVING SECONDARY DISPLAY FOR PROVIDING

VIDEO CONTENT,” which is incorporated herein by reference in its entirety and for all purposes.

[0024] Understand that gaming machine 11 is but one example from a wide range of gaming machine designs on which the present invention may be implemented. For example, not all suitable gaming machines have top boxes or player tracking features. Further, some gaming machines have only a single game display – mechanical or video, while others are designed for bar tables and have displays that face upwards. As another example, a game may be generated in on a host computer and may be displayed on a remote terminal or a remote gaming device. The remote gaming device may be connected to the host computer via a network of some type such as a local area network, a wide area network, an intranet or the Internet. The remote gaming device may be a portable gaming device such as but not limited to a cell phone, a personal digital assistant, and a wireless game player. Images rendered from 3-D gaming environments may be displayed on portable gaming devices that are used to play a game of chance. Further a gaming machine or server may include gaming logic for commanding a remote gaming device to render an image from a virtual camera in a 3-D gaming environments stored on the remote gaming device and to display the rendered image on a display located on the remote gaming device. Thus, those of skill in the art will understand that the present invention, as described below, can be deployed on most any gaming machine now available or hereafter developed.

[0025] Returning to the example of Figure 2, when a user wishes to play the gaming machine 11, he or she inserts cash through a coin acceptor or bill validator. Additionally, the bill validator may accept a printed ticket voucher that may be accepted by the bill validator as indicia of credit. During the game, the player typically views game information and game play using the video display 12.

[0026] During the course of a game, a player may be required to make a number of decisions, which affect the outcome of the game. For example, a player may vary his or her wager on a particular game, select a prize for a particular game, or make game decisions, which affect the outcome of a particular game. The player may make these choices using the player-input switches, the video display screen 12 or using some other device which enables a player to input information into the gaming machine.

[0027] In a particular embodiment, the machine 11 is a multigame machine. Stored electronically within the machine 11 are several different games and for each game a different display for the upper screen 13 is stored. Changing the game played on the machine 11 enables the corresponding display to be viewed on the upper screen 13. Since the screen 13 has replaced the panel 3, the upper display can be animated, thereby making it both more attractive and more attention getting. In some jurisdictions, such as New Zealand, the number of machines 11, which a particular gaming establishment can operate is strictly limited to machines which are able to offer a plurality of games. Thus multigame machines are of increased economic worth.

[0028] In another embodiment, additional games and the displays for a game may be stored on another a remote server and may be made available for download to the gaming machine 11. Details of a game server that may be used with the present invention to download additional games are described in U.S. Patent no. 6,645,077, issued 11/11/2003, and titled "GAMING TERMINAL DATA REPOSITORY AND INFORMATION DISTRIBUTION SYSTEM," which is incorporated herein in its entirety and for all purposes.

[0029] One type of multigame machine has a mechanism by means of which one of the stored games within the machine can be selected for operation (or possibly a sub-range of the stored games). In prior art multigame machines such a mechanism has been a combination of operator accessible buttons (for example located behind a lockable flap) and a menu which the operator is able to cause to be displayed on the screen 2, for example. It is clearly a time consuming activity to unlock the flap, push the required button or buttons to display the menu, follow the menu instructions with more button pushing, close and lock the flap, and then repeat the procedure with the next machine.

[0030] As indicated in Fig. 3, most gaming venues have large numbers of machines generally arranged in rows or banks on a gaming floor. The dimensions of the gaming floor may range from tens of meters to hundreds of meters depending upon the size of the establishment. Fig. 3 illustrates a portion of such a gaming floor. For a small establishment there may be only the three illustrated rows 16 of machines 11 but for a large establishment there may be many such rows 16.

[0031] Also illustrated in Fig. 3 is a personal digital assistant (PDA) 17 such as a PALM PILOT or IPAQ (Registered Trade Marks) or a custom transponder, or similar, which as indicated in Fig. 4, is able to communicate with a communications module 18, which is connected with the master gaming controller 19 of the gaming machine 11. The master gaming controller 19 typically includes a central processing unit (CPU) and controls game play on the machine 11. Details of a master gaming controller 19 that may be used with the present invention are described in co-pending U.S. Application no. 09/690,931, filed 10/17/2000 and titled "HIGH PERFORMANCE BATTERY BACKED RAM INTERFACE," which is incorporated herein in its entirety and for all purposes.

[0032] The communication module 18 may provide communications via a wireless interface. In one embodiment, the wireless interface may be located in a player tracking unit and the communication module may provide a communication link to the player tracking unit. In another embodiment, the wireless interface may be coupled directly to the gaming machine and the communication module may provide a communication link from the wireless interface to the master gaming controller 19.

[0033] The PDA 17 may be equipped with a BLUETOOTH (Registered Trade Mark) module, which enables remote communication over a relatively short range (typically 1 – 10 meters for class II and 10 – 100 meters for Class I). The transmission can be either wireless or infrared and other similar devices such as BLUEFISH (Registered Trade Mark) disclosed in WO 01/54104 can be used instead. However, the BLUETOOTH device has the advantage of wide commercial acceptance. Other wireless standards such as 802.11 ETHERNET, ZIG BEE or similar, can also be used.

[0034] Typically, Bluetooth devices send out signals in the range of 1 milliwatt. The signal strength limits the range of the devices to about 10 meters and also limits potential interference sources. Interference is also limited by using spread-spectrum frequency hopping. For instance, a device may use 79 or more randomly chosen frequencies within a designated range that change on a regular basis up to 1,600 times a second. Thus, even if interference occurs, it is likely only to occur for a short period of time.

[0035] When Bluetooth-capable devices come within range of one another, an electronic conversation takes place to determine whether they have data share or whether one needs to control the other. The connection process is performed automatically. Once a conversation between the devices has occurred, the devices

form a network. Bluetooth systems create a Personal-Area Networks (PAN) or “piconets”. While the two or more devices in a piconet remain in range of one another, the distances between the communications devices may vary as the wireless devices are moved about. Once a piconet is established, such as between the wireless interface device 264 and a portable wireless device, the members of the piconet randomly hop frequencies in unison so they remain in touch with another and avoid other piconets that may be operating in proximity to the established piconet. When Bluetooth is applied in a casino environment, many such piconets may be operating simultaneously. Details of the Bluetooth™ standard and the Bluetooth™ special interest group may be found at www.bluetooth.com.

[0036] Within the PDA 17 is a store of data including the numbers of various authorized employees each having an associated PIN number. Thus an employee enters his authorization number followed by his PIN number to activate the PDA17. The PDA 17 then communicates with all machines 11 in range and interrogates them to confirm an active status. A list of all active machines 11 within range of the PDA17 then appears on the display screen of the PDA17. The authorized employee is then able to select one or a group of machines 11 from those listed on the PDA display. Thus each machine is individually addressable or a group of machines are simultaneously addressable.

[0037] The PDA 17 may store and display information regarding a casino layout on screen 20. Active machines 11 within range of the PDA 17 may be highlighted on the screen 20. In addition, machines 11 selected for modification or interrogation may be highlighted on the screen 20. The PDA 17 may include a GPS receiver or some other location device that allows the location of the PDA to be highlighted on the casino layout. In a large casino, the casino layout and the location device on the PDA

17 may be used to guide a user to a particular gaming machine 11 or a bank of gaming machine 16. For instance, arrows may be displayed on the screen of the PDA 17 to direct a user to a particular location.

[0038] The PDA 17 can then be used both to download commands to the addressed machine(s) 11 and to upload status information or upload responses to the commands. The commands may be compatible with software or firmware currently residing on the gaming machine or a gaming peripheral, such as a bill validator or player tracking unit coupled to the gaming machine.

[0039] In one embodiment, the PDA may be used to select a particular game from a suite of games present in a selected gaming machine or a selected group of gaming machine. In another embodiment, the PDA may be used to select from a suite of games available for download from a server in communication with the gaming machines. For instance, the PDA may be in communication with a remote gaming repository, as described in U.S. Patent no. 6,645,077 previously incorporated herein. The remote server may provide to the PDA 17 details of games, graphics and software components that are available for download.

[0040] The game currently available for play on each gaming machine may be represented using one or more graphical icons displayed over the gaming machines in the casino layout of screen 20, which may help the user in their update process. Further, the PDA 17 may provide performance data for one or more gaming machines as well as performance data for a game in general (e.g., averaged over a number of gaming machines.) The performance data may be employed by the user to help them to select a new game for a particular gaming machine.

[0041] In one embodiment, the performance data may be stored on the gaming machine and the PDA 17 may be operable to interrogate the gaming machine for the

data. In another embodiment, the performance data may be stored on a player tracking unit coupled to the gaming machine and the PDA 17 may interrogate the player tracking unit. In yet another embodiment, the PDA 17 may be operable to contact a remote server that includes performance data for a particular gaming machine.

[0042] The performance data obtained by the PDA may be presented in many different manners, such as data from a particular game played on the gaming machine, data from a number of different games played on the gaming machine or data from games that a particular individual has played. For instance, in one embodiment, the PDA 17 may be used to obtain historical information regarding a previous game that a particular player has played on a gaming machine, such as a game played 5 games prior to the current game. The game history information may be used as part of a dispute resolution process. In another embodiment, the PDA may be able to gather and present game play information for a particular player on all of the gaming machines in wireless communication with the PDA 17.

[0043] In one embodiment, the PDA 17, the remote server, the gaming machine may execute software that analyzes performance data for a gaming machine, a group of gaming machines and different games. This software may be used to project a performance of a particular game that is being considered as an update for a gaming machine or a group of gaming machines. For example, based upon a gaming machine's location, its past performance, a performance of a particular game, and a demographic profile of users (e.g., a distribution of ages), the software may predict and compare performances for a number of selected games. In another embodiment, the software may predict the performance of a group of gaming machines with a particular mix of games. Further, the analysis software may provide performance

predictions that compare different mixes of games and distributions of games applied to a particular group of gaming machines. The performance data, the performance projections and comparisons may be displayed on the display screen 20 of the PDA 17.

[0044] The performance predictions may be generated by multiplying the current performance of the gaming machine by different weighting factors. For example, to predict the effect of a performance of a new game on the gaming machine, the current performance of the gaming machine may be multiplied by a ratio of the average performance of the new game divided by the average performance of the new game. As another example, to predict the effect of a new game on the gaming machine, the current performance of the gaming machine may be multiplied by a ratio of the performance of gaming machine with the new game in a similar location divided by the performance of the gaming machine in the current location.

[0045] The demographic weighting factors may be generated using player tracking data to determine the relative popularity of different games as a function of a person's age. For game selection, these weighting factors may be useful during a particular time of year. For instance, the number of young people may increase during weekends or spring break as compared to other times of the year. Thus, given a selection of a new game, an expected demographic distribution and a relative popularity of the game as a function of the demographic distribution, a prediction for the performance of the new game on the gaming machine (e.g., coin-in/time) may be made.

[0046] Once a game has been selected for a gaming machine or group of gaming machine, the PDA 17 may be used to simultaneously update all machines to the desired game thereby enabling rapid game changes to suit a busy venue social

program. The game change may include the update of the graphics presented on display screen 13. If desired, the game change-over can be programmed to operate at a specific time in the future (in conjunction with the CPU clock) or after a specified time delay.

[0047] In addition, the authorized employee can interrogate the machine, or each machine in turn, to ascertain various operational parameters such as rate of note rejects, rate of coin rejects, cash turnover ratio, and the like. This enables the authorized employee to make various managerial decisions in addition to more routine functions such as “keying-off” a jackpot on a machine. When this happens the credit value and security information are uploaded from the electronic controller 19 via the communications module 18 to the PDA17. Preferably the PDA17 includes a printer which enables the authorized employee to print a small coupon or ticket which the winning player can redeem for cash at a change booth. This development overcomes the previous need for each machine to have a ticket or coupon printer and even the need for a hopper for prize payments.

[0048] The same arrangements can also be used to download data into a machine 11. Thus a player wishing to transfer credits from one machine to another merely has to catch the attention of the authorized employee who then uses the PDA17 to upload the credits from the first machine 11 and then download the credits to the second machine 11.

[0049] Furthermore, the machines 11 can call for assistance once a fault is detected by internal surveillance equipment. Thus any PDA17 in range of a given machine 11 can be advised that, for example, the cash tin is almost full, the hopper is almost empty, printer paper is low, various lamps and/or buttons have malfunctioned,

and the like. This enables maintenance or preventative maintenance, to be carried out at the earliest opportunity. As a consequence machine downtime is reduced.

[0050] In connection with maintenance, prior art machines require a significant amount of time for technicians to manually enter data, such as configuration data, into a machine. Such data includes game type, percentage return, button panel layout, GMID number, house number and the like. Instead by use of the PDA17, this data can be quickly downloaded to a particular machine 11, or a group of such machines 11. Similarly, diagnosis of any fault in the machine 11 can be speeded up by status data upload, especially in the case where the machine screen 2,12 has malfunctioned.

[0051] In this connection, it will be appreciated that transfer of a sub-routine stored in the PDA17 is a much faster method of data input than manual manipulation of the prior art 3-button up/down menu selection system used by the prior art machines 1 of Fig. 1.

[0052] The PDA17 can also be used to check the integrity of gaming machine software even whilst a machine 11 is being played. For example, a cyclic redundancy check calculation of the machine program storage devices can be requested by the PDA17 without either the need to interrupt a player or the need for connection to any other system.

[0053] It will be appreciated by those skilled in the art that the system is especially secure since there is no transfer of "high security" data such as critical or game dependent data to, or from, the machine 11. Thus the integrity of the gaming machine software cannot be compromised even if the transmission protocols become known. Thus all software (both operating system and game programs) located in the gaming machine 11, will be as submitted to, and approved by, the game licensing authorities. This is assisted by the preferred limited transmission range of the

BLUETOOTH apparatus which makes it unlikely that anyone outside the gaming venue would be able to obtain wireless access to any of the machines 11.

[0054] Furthermore, some large gaming establishments with many gaming machines have monitor systems which cost hundreds of thousands of dollars. One aspect of such monitor systems is that they provide a player tracker function.

However, the above described communications system can provide a low cost “entry level” player tracker function for those venues having a relatively small number of gaming machines. This is achieved by the PDA17 being used to upload game results from the machines 11. This data can then be transferred to a personal computer, or similar, and manipulated at will.

[0055] Although the foregoing invention has been described in detail by way of illustration and example for purposes of clarity and understanding, it will be recognized that the above described invention may be embodied in numerous other specific variations and embodiments without departing from the spirit or essential characteristics of the invention. Certain changes and modifications may be practiced, and it is understood that the invention is not to be limited by the foregoing details, but rather is to be defined by the scope of the appended claims.